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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

O'CONNOR, P. et al.

: Docket: ACH 2946 US

Serial No.: 10/602,803

: Examiner: Christina

Ann Johnson

Filing Date: June 24, 2003

: Group Art Unit: 1725

Title: USE OF CATIONIC LAYERED MATERIALS,  
COMPOSITIONS COMPRISING THESE  
MATERIALS, AND THE PREPARATION OF  
CATIONIC LAYERED MATERIALS

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on \_\_\_\_\_

## DECLARATION UNDER 37 CFR § 1.132

By

Dr. William Jones

I, William Jones, hereby declares that I am a member of the staff of the  
Department of Chemistry, University of Cambridge, Lensfield Road, Cambridge, CB2  
1EW, UNITED KINGDOM.

That I am a citizen of the United Kingdom over twenty-one years of age and  
reside in the city of Cambridge, United Kingdom.

That I am a Research Chemist, holding the degree of PhD in Physical Chemistry,  
and am an inventor of the above captioned Patent Application.

That I am familiar with an Official Office Action for the instant Application,  
mailed April 21, 2005, in which original composition claims 1-9 and claims 21-22 were  
rejected as being anticipated, or, alternatively, obvious, over Soled et al. (US 6,162,350),  
Stamires et al. (US 6,716,785) and Soled et al. (US 6,156,695).

That as a result of experimentation I have conducted and for the reasons given  
below, I conclude that the instant composition claims (new claims 28 and 29 and claims  
2, 3, 8, 9, 30, 31 and 32 that depend therefrom) are product by process claims that claim  
compositions which are novel and non-obvious over the prior art by virtue of their  
unique structure and composition.

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That the product of the present invention, as prepared (i.e. before any further treatment or addition of binder) is clearly different structurally to that disclosed in the Soled et al and /stamires et al. patents. Our composition contains both (i) a cationic layered material (CLM) phase and (ii) an additional phase. This additional phase being identified mainly by the presence of extra reflections not present for a CLM at 18.5 and 29 degrees two-theta. See Figure 1 which compares a pure CLM (TOP) with our product (BOTTOM), and Figure 2 which is an expansion of the region around 29 degrees two theta. The additional reflections in our composition are associated with the aluminum component identified by chemical analysis.

In the Examples of the instant text, we repeatedly refer to "The product contained a cationic layered material structurally identical to that reported by Astier et al". By this we mean that the product contained X-ray diffraction reflections similar to those reported by Astier. In addition (again shown in the attached Figures) our material contained an additional phase - formed directly during the synthesis and derived from one or more of the reacting components and not subsequently added to the CLM after synthesis.

The binder used by Soled et al., and referred to by the Examiner, was boehmite (Soled et al. also discloses gibbsite). Boehmite has a characteristic X-ray pattern, see Figure 3 (gibbsite would have a similar pattern), and it is clear that for our product the phase additional to the CLM is not boehmite.

With regard to the Soled et al. and Stamires et al. patents and the possible equivalence of the CLM compositions of Soled et al. and Stamires et al. and our CLM composition with the additional aluminum phase: for example, Soled claims (Claim 2 of '695 and Figure 1 of the patent) that the product of calcination of his CLM (treatment at 400 C) is essentially amorphous with two peaks at  $d = 2.53$  and  $d = 1.70$  Å. In Figure 4 we show the product that we obtain after calcination (400 C for 6 hours) of our CLM composition; it is apparent that our calcined product is structurally quite different to that of Soled et al (and would be equally so with regard to Stamires et al.) being in fact relatively crystalline.

It is quite evident that making a physical mixture of our composition with a boehmite alumina binder will be distinct from a physical mixture of Soled et al.'s and Stamires et al.'s compositions with a boehmite alumina binder, because CLM prepared according to our method has a different structure, as shown by XRD, than the CLM of Soled et al, and this difference would carry over to the mixtures of the respective CLMs with gibbsite (or boehmite).

The essential fact is that in our CLM the aluminum phase is formed directly during the CLM synthesis and derived from one or more of the reacting components, as opposed to being physically mixed with the CLM.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that those statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Sec. 1001 of

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Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

W Jones  
William Jones

June 17 2005 Date